Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1-8. (Canceled)

9. (Original) A method for saving and restoring states of a diagnostic module, comprising:

providing a diagnostic module adapted to change its state in response to trigger events generated by a microprocessor and to halt the microprocessor in response to a specified combination of trigger events and previous states;

saving the previous state of the diagnostic module in a backup register; and

if the trigger event is not valid, using the backup register to restore the diagnostic module to its previous state.

10. (Original) The method as recited in claim 9, wherein generating a trigger event comprises issuing a specified memory address.

11. (Original) The method as recited in claim 10, wherein generating a trigger event further comprises accessing a specified data value.

12. (Canceled)

13. (Currently Amended) The method as recited in claim 9, ~~wherein the microprocessor~~ further ~~comprises an exception handler that returns~~ comprising returning execution to a branch instruction, upon returning from an exception associated with ~~the~~ an instruction immediately following the branch instruction.

14. (Currently Amended) The method as recited in claim 13, further comprising generating an invalid trigger event by re-executing the branch instruction upon returning from the exception ~~handler~~.

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15. (Currently Amended) A microprocessor~~, with an associated~~ comprising a diagnostic module, said module comprising:

a state machine~~,~~ adapted to change its internal state in response to trigger events generated by the microprocessor, and adapted to halt the microprocessor in response to a trigger event and a preceding internal state prior to the trigger event;

a backup register~~,~~ adapted to save the preceding state of the state machine when it changes state in response to the trigger event; and

state restoration logic~~,~~ adapted to use the backup register to restore the state machine to its preceding state, if the trigger event is invalid.

16. (Currently Amended) The ~~diagnostic system~~ microprocessor as recited in claim 15, wherein the trigger events ~~comprise~~ are generated in response to a specified memory addresses.

17. (Currently Amended) The ~~diagnostic system~~ microprocessor as recited in claim 15, wherein the trigger events ~~further comprise~~ are generated in response to a specified data values.

18. (Currently Amended) The ~~diagnostic system~~ microprocessor as recited in claim 15, wherein the microprocessor further comprises an exception handler that returns execution to a branch instruction, upon returning from an exception associated with ~~the~~ an instruction immediately following the branch instruction.

19. (Currently Amended) The diagnostic ~~system~~ microprocessor as recited in claim 15, wherein an invalid trigger event comprises a branch instruction that is re-executed upon returning from the exception handler.

20. (New) The microprocessor as recited in claim 15, wherein the microprocessor is equipped with an instruction pipeline.

21. (New) The microprocessor as recited in claim 15, wherein the microprocessor is equipped with an enhanced joint test action group (EJTAG) compliant interface for supplying inputs to, and receiving outputs from, the diagnostic module.

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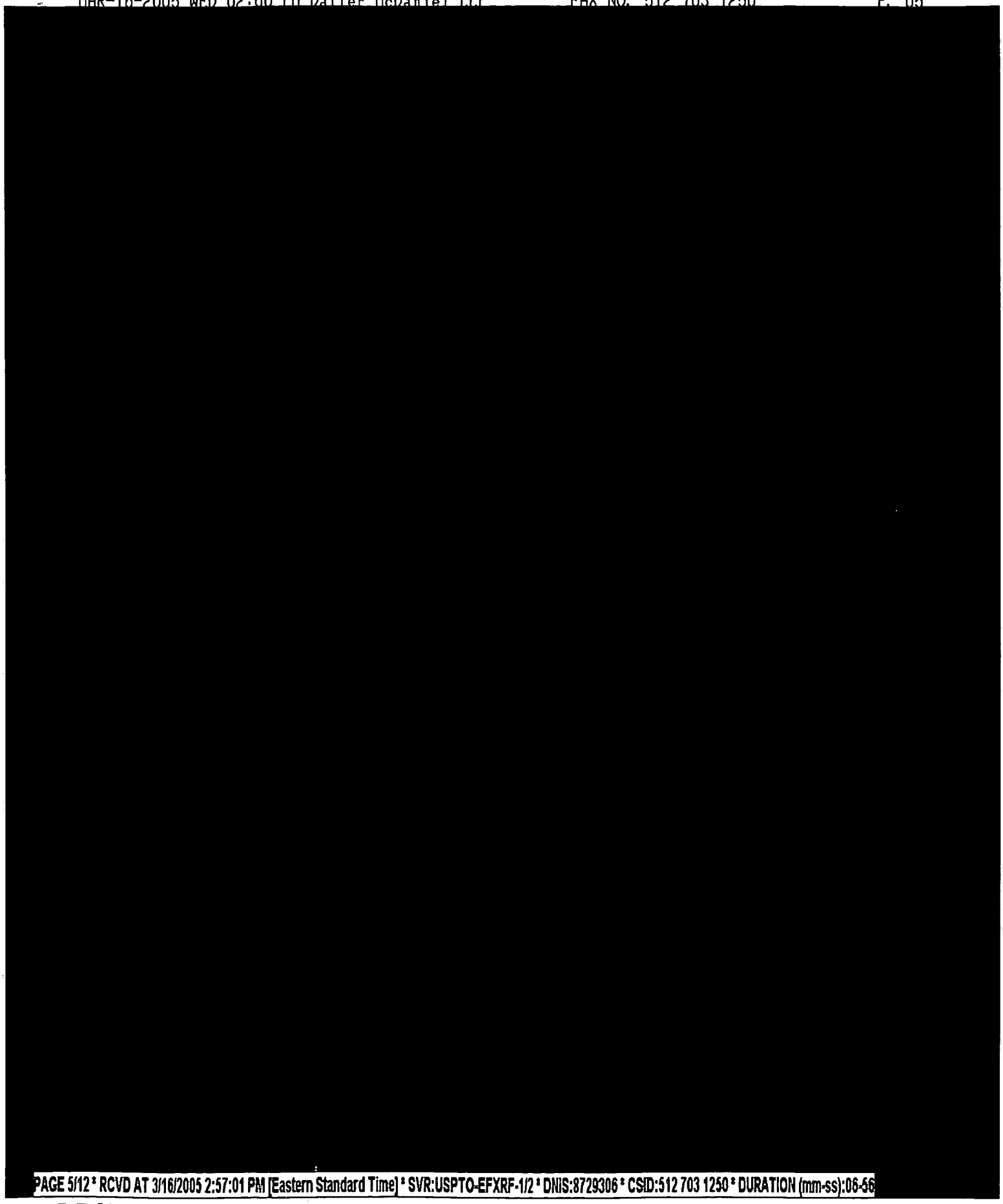

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